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ID	Task Name	Duration	Start	Finish	Oct '13					Nov '13				Dec '13				Jan '14				Feb '14				Mar '14				Apr '14				May '14				Jun '14				Jul '14				Aug '14						
					22	29	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	2	9	16	23	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17
45	deliver and set precast for abutment 2 footing	6 hrs	Thu 5/8/14	Fri 5/9/14																																																
46	grout under abutment 2 footing	6 hrs	Fri 5/9/14	Fri 5/9/14																																																
47	deliver and install precast abutment breastwall pieces - abutment 2	8 hrs	Sat 5/10/14	Sat 5/10/14																																																
48	grout abutment pieces where applicable (connection to footing)	6 hrs	Sun 5/11/14	Sun 5/11/14																																																
49	deliver and install wing wall 3 - abutment 2 side	6 hrs	Sun 5/11/14	Mon 5/12/14																																																
50	deliver and install wing wall 4 - abutment 2 side	6 hrs	Mon 5/12/14	Tue 5/13/14																																																
51	form and place CIP wing wall #3	30 hrs	Mon 5/12/14	Fri 5/16/14																																																
52	form and place CIP wing wall #4	30 hrs	Tue 5/13/14	Fri 5/16/14																																																
53	Grout Wing Walls as required (connection to footing and breastwall)	10 hrs	Tue 5/13/14	Wed 5/14/14																																																
54	backfill abutment 2	23 hrs	Sat 5/17/14	Mon 5/19/14																																																
55	SUPERSTRUCTURE	21.5 days	Sun 5/11/14	Sun 6/1/14																																																
56	Install Structural Steel beams	6 hrs	Sun 5/11/14	Sun 5/11/14																																																
57	prepare for NEXT beam installation	6 hrs	Sun 5/11/14	Mon 5/12/14																																																
58	deliver and install NEXT beams	10 hrs	Mon 5/12/14	Tue 5/13/14																																																
59	form and place closure strips	14 hrs	Tue 5/13/14	Thu 5/15/14																																																
60	deliver and install approach slabs - abutment 1	8 hrs	Tue 5/13/14	Wed 5/14/14																																																
61	deliver and install approach slabs - abutment 2	6 hrs	Mon 5/19/14	Tue 5/20/14																																																
62	form and place closure strips in approach slabs	4 hrs	Tue 5/20/14	Wed 5/21/14																																																
63	form and place CIP bridge rail parapets	30 hrs	Thu 5/15/14	Mon 5/19/14																																																
64	form and place leveling slab (overlay)	15 hrs	Thu 5/22/14	Sat 5/24/14																																																
65	form and place sidewalk	13 hrs	Sun 5/25/14	Tue 5/27/14																																																
66	install spray applied membrane	12 hrs	Tue 5/27/14	Wed 5/28/14																																																
67	finish backfill / approaches (fine grade)	12 hrs	Wed 5/28/14	Fri 5/30/14																																																
68	pave project	18 hrs	Fri 5/30/14	Sun 6/1/14																																																
69	Open Road	0 days	Sun 6/1/14	Sun 6/1/14																																																
70	Approaches / Utilities	20.25 days	Tue 5/13/14	Mon 6/2/14																																																
71	Install Waterline under bridge & activate	3 days	Tue 5/13/14	Fri 5/16/14																																																
72	install drainage materials	3 days	Fri 5/16/14	Mon 5/19/14																																																
73	install guardrail & Bridge rail	12 hrs	Sun 6/1/14	Mon 6/2/14																																																
74																																																				
75	POST CLOSURE ACTIVITIES	68 days	Sun 6/1/14	Fri 8/22/14																																																

Project: INITIAL PROJECT SCHEDULE
Date: Thu 11/14/13

Task

Critical Task

Progress

Milestone

Summary

Rolled Up Task

Introduction / Description

This narrative is written in accordance with section 900.645 – CPM schedule which is located on pages 48 – 52 of the special provisions. This project involves the removal and replacement of bridge 13 on a new alignment. The existing bridge is comprised of a cast-in-place arch which will be replaced by a NEXT beam style bridge with an aesthetic arch and precast arch panels in an effort to make the appearance of the new bridge similar to the existing.

This particular project presents its fair share of challenges with regards to the schedule. Perhaps the best way to navigate through this project is to break it down into 4 major categories; preconstruction activities, pre-closure activities, construction during closure, and post-closure activities.

PRECONSTRUCTION ACTIVITIES: Present time – Early March

This section is basically described as preparation and planning. This phase begins with the bid date of 10/4/13 and also includes the preconstruction meeting(s), and the initial submittal of all applicable working drawings, schedules, and the process of issuing subcontracts and material contracts.

Specifically, this phase will last most of the winter into early February 2014. At that point, T Buck hopes to have all major items submitted on and approved. Depending on several factors, the precast concrete should be cast during this phase. JP Carrara will be supplying the precast and they are located in Middlebury so it is convenient to say the least. Our goal is to have all the precast made and ready before we begin construction on site. Other long lead items include the bearings from DS Brown and structural steel from ARC Fabricators.

PRE-CLOSURE ACTIVITIES: Early December – April 19th

This phase begins with the mobilization of all the administrative materials (i.e. office trailers, phones, computers, temporary power, etc.). We plan to begin mobilizing the office trailers in early March so the process of installing phone and internet can begin and be completed for April 1st. Project demarcation fence, silt fence, and other erosion control measures will be installed per the approved ESPC. All the work completed in this phase will be done so using lane closures if necessary (to the least extent possible).

As for the work on site, during this phase we will be installing the access roads on the northeast corner at a minimum. We will also be preparing and constructing applicable lay down areas onsite. Once the access roads are constructed, we will be installing a platform under the bridge to facilitate debris containment and to provide a staging area for the precast arch installation. The platform will be constructed using old bridge beams with a crane mat deck.

All the detour signs will be laid out and dig safe will be called in for each location. The signs will be laid out and installed in close conformance with plan sheets 23-28. These signs will take about a week to install. The signs will be covered in preparation for the shutdown.

Concerns / potential issues or conflicts:

This phase is critical for the preparation of the shutdown. Layout is vital in this phase and we will need to determine exactly how and where we will establish off sets and bench marks for quick reference while we are excavating and demolishing the existing arch. The platform installation will present some challenges because it is important not to install the platform so it will interfere with the precast arch or its footings. We have entertained placing some sacrificial concrete on the existing “ledge shelf” on each side to provide a level surface to install the platform framing which will consist of old bridge beams. It will also have to be installed in such a way that we will need to take it out after the arch is installed.

CONSTRUCTION DURING CLOSURE: April 19th – June 2nd.

This phase will begin with the closing of the road at 7:00 am on Saturday April 19th. The detour signs will be uncovered immediately before the road is closed.

We will immediately begin excavating the approaches to expose the Arch. The demolition process will last several shifts as we will be working 24 hours per day during the closure. The next step after the demolition of the existing arch is complete is to prepare the clean ledge for casting the arch footings and sub footings under the abutments. The excavation on abutment one side should be relatively simple when compared to abutment 2. The south side of the bridge will require around 300 CY of ledge to be removed which will take significantly longer than the excavation around the north abutment.

The cast in place arch footings will be constructed and placed at the same time. We also hope to have the subfootings completed and placed within a day of the placement of the precast arch footings. Once the cast in place concrete for the arch footing is completed and placed, we will begin the setting the precast Arch. While the concrete is setting up & curing, we will be constructing a shoring tower in the middle of our platform (which was installed in the pre-closure phase). The size and capacity of the tower has yet to be determined but needless to say it will be designed to support any and all applicable loads associated with the precast arch.

Once the arch is set, we will set the abutment footings and place a 3" grout bed under them as shown in the contract drawings. Any applicable connection will also be grouted in accordance with the recommendation from JP Carrara. Once the footings are set and the grout has reached an acceptable strength, the abutments will be set in the keyway of the footings. The abutments will be set on HDPE blocks/wedges to ensure the proper elevation is achieved, then the connection points will be grouted and the keyway will be flooded with grout under the breast wall(s).

At this point the critical path will become the installation of the NEXT beams so the superstructure can be completed. The NEXT beams will be the biggest challenge to set because they weigh approximately 110 kips. When the NEXT beams are delivered, they will be picked up and set using an operation which will be shown in better detail when the erection plan is finalized and submitted.

Depending on the progression of the abutment 2 ledge excavation, the wing walls will be installed. The wings on Abutment 1 are complete precast while the wings on abutment 2 consist of a precast panel and the remainders of the wings are cast in place against a near vertical face of ledge. While wing wall #3 and #4 are being finished, the backfill operation can

commence on Abutment 1. When the wings are completed on the abutment 2 side, backfilling operation can commence.

After the beams are in place, the closure strips will be formed and placed using rapid-set concrete. Once the beams are installed, the parapet will be formed and placed. Then the placement of a leveling slab that extends to each barrier will take place. At this point in time, we plan to request permission to use a light weight vibratory screed to speed up the process. After the overlay (leveling slab) is placed, the sidewalk on the west side of the bridge can be formed and placed.

While the superstructure is being built, backfill operations will be taking place and all the drainage structures (3 of them) will be installed per plan. In addition to the drainage, we will also be installing and activating a waterline which will be installed under the bridge. When backfill has reached the approach slab elevation, the precast approach slabs will be installed the seams between each piece will be formed and placed using the rapid set concrete.

The spray applied membrane will be installed as soon as practicable. Once the approach slabs are backfilled and the approaches are fine graded, we will install pavement. Then the guardrail and bridge rail will be installed and a final walkthrough will take place to ensure all applicable items are taken care of prior to opening the bridge to traffic.

Concerns / potential issues or conflicts:

The success of this schedule depends on everything going as planned during this phase. The first major hurdle will be demolishing the existing arch and establishing the proper ledge elevation for the installation of the cast in place sub footings and arch footings. The borings only tell part of the story and we will have enough equipment onsite to adapt to any “normal” conditions that arise (i.e. Hoe Rams, Grinders, jack hammers, Etc.). we plan to have a blasting plan completed and submitted so if blasting becomes necessary, we will be able to move immediately with interruption from submittals / approvals. As a result of doing a plan so far in advance, there will likely be several potential scenarios presented in case one method becomes more feasible than another.

The precast concrete was designed to be at very specific elevation(s) so the removal of the ledge in the critical locations is a HUGE unknown. Based on the borings in the contract, there will most certainly be some ledge removal on both sides of the river. After an initial elevation is achieved, the preparation of the ledge on the back side of wing wall 3 & 4 is also very important to the timely completion of the substructure. We will have to cast the remaining portion of the aforementioned wings in place so the profile of the ledge will be “smoothed” out in an effort to

speed up the forming against the ledge. We feel it important to not include wing walls 3 & 4 in the critical path which is why it is very likely we will be setting the NEXT beams on the breast wall before the wings are completed on abutment two.

The NEXT beams are very heavy. We plan to use an enormous crane on the abutment one side near the end of wing wall 2 which should be able to set every piece of precast on the project. As soon as the backfill operations are completed, we will plan to use a rough terrain crane to set the approach slabs as the pad used for the big crane will have to be removed. A more detailed erection plan will be developed to ensure the installation of the NEXT beams is successful.

Once the NEXT beams are in place, the chain of events needs to take place in a flawless manner. The cure time for the concrete will be critical and may potentially come into play when moving from one step to the next. For example, after we place the Parapets on the bridge, we will need to wait a day (at least) before stripping the forms, and obviously the forms need to be stripped prior to placing the overlay. The same issue will come into play when we are getting ready to place the sidewalk after the overlay.

In general, this phase is obviously the most critical and the most important. We plan to have all the materials stockpiled and ready to go before the shutdown begins. The stockpiled materials will be readily available at all hours of the day or night so not to slow down production. We plan to have a “runner” available 24/7 to make any emergency runs to get a part or piece of something. By all accounts this schedule will be grueling and hard. We will be working through rain and all types of weather.

POST CLOSURE ACTIVITIES: June 2nd – August 22nd

Once the road is opened to traffic, we will remove all the detour signs and stack/deliver the applicable signs to VAOT. A plan will be developed to leave the signs required for the remaining closures on the other concurrent projects in the area. Then we will begin the installation of the precast arch panels and the forming and placing of the Coping on each fascia. There will be some cast in place closure placements near the bottom of the arch at all four corners. The structural steel supports will be installed during the closure period and as long as everything is fabricated correctly. We should be able to connect everything with relative ease. Each connection point will have a slotted connection or other adjustment mechanisms to ensure proper alignment. There will be a staging system inside the arch so the connections can be made on the back side of the panels. The cast in place coping will be formed and placed during normal working hours while a single lane closure is utilized when necessary.

In addition to the remaining concrete items (precast & cast-in-place) there will be several other contract items to complete after the closure. We will be installing the Arch Lighting, removing our access platform and access roads, installation of approximately 500 cy of Type II stone, and installation of final slope stabilization / permanent erosion control measures. When the contract work is complete we will request and complete the final punch list and begin the demobilization process.

Concerns / potential issues or conflicts:

The arch lighting is vague and is somewhat of an unknown at this time, the contract seems to imply that it's up to the contractor to design and implement something that is acceptable to VAOT. We will be working with a subcontractor to get something designed and installed that will be both economical and functional for the state.

The arch panels will be transported laying down and consequently will have to be flipped upright to be installed. The rigging and setting of the arch panels is somewhat of an unknown because it will be important for them to hang plumb so both connections can be made (at arch and at structural steel). Another potential issue is the cast in place coping. The details on the plans call for a very small "air gap" between the bottom of the cast in place coping and the top of the precast arch pieces. I suspect there will be a modified detail that will hang down over the face of the panel to avoid any eyesores with regards to inevitable variations in the elevation of the precast panels. A detail will be discussed and presented for approval that will be constructible while providing the aesthetic appearance the state desires. The removal of the platform and access roads will be done the same way we installed them, the deck will be removed and the framing will be taken out. Then the sacrificial concrete (if necessary) will be removed and the area cleaned up to the satisfaction of the resident engineer.